2010-2011 Graduate Calendar

The information published in this Graduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2010-2011 academic years, including the Fall Semester 2010, the Winter Semester 2011 and the Summer Semester 2011.

For your convenience the Graduate Calendar is available in PDF format.

If you wish to link to the Graduate Calendar please refer to the Linking Guidelines.

The University is a full member of:

- The Association of Universities and Colleges of Canada

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Disclaimer

The Office of Graduate Studies has attempted to ensure the accuracy of this on-line Graduate Calendar. However, the publication of information in this document does not bind the university to the provision of courses, programs, schedules of studies, fees, or facilities as listed herein.

Limitations

The University of Guelph reserves the right to change without notice any information contained in this calendar, including any rule or regulation pertaining to the standards for admission to, the requirements for the continuation of study in, and the requirements for the granting of degrees or diplomas in any or all of its programs.

The university will not be liable for any interruption in, or cancellation of, any academic activities as set forth in this calendar and related information where such interruption is caused by fire, strike, lock-out, inability to procure materials or trades, restrictive laws or governmental regulations, actions taken by the faculty, staff or students of the university or by others, civil unrest or disobedience, Public Health Emergencies, or any other cause of any kind beyond the reasonable control of the university.

The University of Guelph reaffirms section 1 of the Ontario Human Rights Code, 1981, which prohibits discrimination on the grounds of race, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, handicap, age, marital status or family status.

The university encourages applications from women, aboriginal peoples, visible minorities, persons with disabilities, and members of other under-represented groups.

Introduction

Collection, Use and Disclosure of Personal Information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31_e.htm. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes. Certain personal information is disclosed to external agencies, including the Ontario Universities Application Centre, the Ministry of Training, Colleges and Universities, and Statistics Canada, for statistical and planning purposes, and is disclosed to other individuals or organizations in accordance with the Office of Registrarial Services Departmental Policy on the Release of Student Information. For details on the use and disclosure of this information call the Office of Registrarial Services at the University at (519) 824-4120 or see http://www.uoguelph.ca/registrar/registrar/index.cfm?index.

Statistics Canada - Notification of Disclosure

For further information, please see Statistics Canada's web site at http://www.statcan.gc.ca and Section XIV Statistics Canada.

Address for University Communication

Depending on the nature and timing of the communication, the University may use one of these addresses to communicate with students. Students are, therefore, responsible for checking all of the following on a regular basis:

Email Address

The University issued email address is considered an official means of communication with the student and will be used for correspondence from the University. Students are responsible for monitoring their University-issued email account regularly.

Home Address

Students are responsible for maintaining a current mailing address with the University. Address changes can be made, in writing, through the Office of Graduate Studies.

Name Changes

The University of Guelph is committed to the integrity of its student records, therefore, each student is required to provide either on application for admission or on personal data forms required for registration, his/her complete, legal name. Any requests to change a name, by means of alteration, deletion, substitution or addition, must be accompanied by appropriate supporting documentation.

Student Confidentiality and Release of Student Information Policy Excerpt

The University undertakes to protect the privacy of each student and the confidentiality of his or her record. To this end the University shall refuse to disclose personal information to any person other than the individual to whom the information relates where disclosure would constitute an unjustified invasion of the personal privacy of that person or of any other individual. All members of the University community must respect the confidential nature of the student information which they acquire in the course of their work.

Complete policy at http://www.uoguelph.ca/policies.

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Land Resource Science

The School of Environmental Sciences offers program of study leading to MSc and PhD degrees. Graduate Studies in the Land Resource Science program are designed to train people to work independently and imaginatively with a high level of technical skill and scientific acumen in various areas of environmental biology.

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Jon S. Warland
BSc Cornell, MSc British Columbia, PhD Guelph - Associate Professor

MSc Program

Admission Requirements

In addition to the minimum requirements stated elsewhere in the Graduate Calendar, admission to the graduate program is dependent on the availability of an advisor, space and funding.

Students entering the MSc program will be expected to have taken, or be familiar with the content of, introductory courses in atmospheric science, soil science, earth science and land resource management, either through appropriate courses or a program of self study.

Thesis Degree Requirements

All students in the MSc by thesis program are required to enroll in the two-course sequence Research Issues I and II. The objectives of these courses are to enhance the skills needed for a research career (including cross-disciplinary research); foster the development of superior communication skills; increase the student's awareness of major issues related to land resources, and current research; and provide an environmental, social and economic context for this research. It is recommended that students enroll in the courses during their first year. Candidates for the thesis-based MSc degree must successfully complete a prescribed series of courses, conduct a research project, prepare a thesis based on their results and defend this in a final examination. The number of course credits required in this option will be decided by the student's advisory committee in consultation with the student, and may exceed the minimum 1.5 credits required by the Faculty of Graduate Studies.

Course Work and Research Project Requirements

Candidates for the MSc degree by course work and research project must complete a minimum of 4.0 credits, including one credit of research project and at least two credits from courses in one of the four fields (below). Of these courses, one will be the Land Resource Science Research Project, LRS*6500 (two semesters, 1.0 credit). The research project will be a detailed, critical review of an area of study related to the specialization chosen by the student including analyses and interpretations of relevant data. The student may or may not be involved in collecting the data. The content of the research project will be presented to the department as a seminar.

The remaining credit may be from another field, or from the courses designated as Policy or Data Analysis below. A maximum of one approved senior-level undergraduate course can be included in the list of prescribed courses.

At the beginning of the program, the student and student's advisory committee will design the course-work MSc according to the program guidelines and the aspirations and background of the student. MSc by course work and major paper degree will require a minimum of three semesters of full-time study (or the equivalent).

Core Courses - Data Acquisition

Atmospheric Science

LRS*6000	[0.50]	Physical Environment of Crops and Forests
LRS*6040	[0.50]	Micrometeorology
LRS*6060	[0.50]	Meteorological Instrumentation
LRS*6241	[0.25]	Special Topics in Atmospheric Science
LRS*6242	[0.50]	Special Topics in Atmospheric Science
LRS*6440	[0.50]	Field Sampling Strategies and Geostatistics
LRS*6500	[1.00]	Land Resource Science Research Project
LRS*6760	[0.50]	Advanced Remote Sensing

Soil Science

LRS*6250	[0.50]	Soil Genesis and Classification
LRS*6280	[0.50]	Soil Physics
LRS*6340	[0.50]	Soil Organic Matter and Biochemistry
LRS*6360	[0.50]	Soil and Water Chemistry
LRS*6380	[0.50]	Advanced Soil Chemistry
LRS*6440	[0.50]	Field Sampling Strategies and Geostatistics
LRS*6500	[1.00]	Land Resource Science Research Project
LRS*6760	[0.50]	Advanced Remote Sensing

Environmental Earth Science

LRS*6280	[0.50]	Soil Physics
LRS*6360	[0.50]	Soil and Water Chemistry
LRS*6440	[0.50]	Field Sampling Strategies and Geostatistics
LRS*6500	[1.00]	Land Resource Science Research Project
LRS*6730	[0.50]	Special Topics in Environmental Earth Science
LRS*6760	[0.50]	Advanced Remote Sensing

Land Resource Management

LRS*6300	[0.50]	Applied Soil Physics
LRS*6340	[0.50]	Soil Organic Matter and Biochemistry
LRS*6400	[0.50]	Soil Nitrogen Fertility and Crop Production
LRS*6420	[0.50]	Soil Productivity
LRS*6500	[1.00]	Land Resource Science Research Project
LRS*6760	[0.50]	Advanced Remote Sensing
LRS*6881	[0.25]	Special Topics in Land Resources Management
LRS*6882	[0.50]	Special Topics in Land Resources Management
RPD*6410	[0.50]	Readings in Rural Planning
LARC*6430	[0.50]	Landscape Resource Analysis
GEOG*6281	[0.50]	Environmental Management and Governance

Additional Courses

Policy

GEOG*6281	[0.50]	Environmental Management and Governance
POLS*6390	[0.50]	Environmental Politics and Policy

Data Analysis

STAT*6801	[0.50]	Statistical Learning
STAT*6802	[0.50]	Generalized Linear Models and Extensions
STAT*6950	[0.50]	Statistical Methods for the Life Sciences
STAT*6960	[0.50]	Design of Experiments and Data Analysis for the Life Sciences

PhD Program

Admission Requirements

Students who are applying for admission to the PhD program, and who have completed an MSc in another program (at Guelph or at a different University), will follow the application procedures prescribed by the Office of Graduate Studies. Students lacking the same level of understanding across fields and within fields as graduates from the MSc program will be expected to correct this deficiency early in their PhD program.

Students intending to continue directly into a PhD program after the completion of an MSc within the program must complete a full application for the PhD degree. This application should be submitted at least two months before meeting the requirements of the MSc degree. Superior MSc students may be permitted to transfer to the PhD program without completing the master's degree.

Degree Requirements

Students must pass a qualifying examination and successfully prepare and defend a thesis, as specified under the general regulations for the PhD degree. Students must complete the following courses as the minimum course requirements. Additional courses will be determined by the advisory committee.

LRS*6900 [0.25] Research Issues I
LRS*6910 [0.25] Research Issues II

Students are encouraged to develop an advanced level of understanding of two or more additional areas of specialization which are related to the area of their research and to participate in cross-disciplinary or collaborative research programs where opportunities permit.

Collaborative Programs

Toxicology Program

The School of Environmental Sciences participates in the collaborative program in Toxicology. Students register in both the department and the collaborative program.

Courses

Atmospheric Science

LRS*6000 Physical Environment of Crops and Forests F [0.50]

Recent literature on temperature, humidity, radiation, wind, gases and particles in crop and forest environments; evapotranspiration and photosynthesis of plant communities; modification of microclimates; applied micrometeorology. Offered in even-numbered years.

LRS*6040 Micrometeorology W [0.50]

Exchanges of mass, momentum and energy between the surface and the atmosphere will be studied in the context of larger-scale meterology. Diffusion and turbulence in and above plant canopies will be examined from theoretical and practical perspectives. Topics include time-series analysis, micrometeorological measurement theory, and basic principles of atmospheric science. Offered in even-numbered years.

LRS*6060 Meteorological Instrumentation W [0.50]

Theoretical and practical aspects of electronic circuits, sensors, and equipment used in meteorological research.

LRS*6241 Special Topics in Atmospheric Science F,U [0.25]

The content is determined by the interests of the students and the availability of instructors. Topics may include aspects of statistics for climatology, animal biometeorology, air pollution meteorology, and hydrometeorology.

LRS*6242 Special Topics in Atmospheric Science F,U [0.50]

See LRS*6241

Soil Science

LRS*6250 Soil Genesis and Classification F [0.50]

A discussion of world soil regions for students not specializing in soil genesis.

LRS*6280 Soil Physics W [0.50]

The soil as a physical system with special regard to soil water movement and the diffusion and dispersion of chemical substances. Numerical techniques and computer solutions will be developed.

LRS*6300 Applied Soil Physics F [0.50]

The application of soil physical principles to practical problems concerning soil physical quality, erosion, land reclamation and industrial-waste disposal on land

Prerequisite(s): SOIL*3070.

LRS*6320 Non-equilibrium Thermodynamics of Porous Media W [0.50]

Transport processes in porous media such as soils, clays, and membranes are dealt with in the framework of non-equilibrium thermodynamics with emphasis on the coupling between water, solutes, heat and electric charge transport. Offered in even-numbered years.

LRS*6340 Soil Organic Matter and Biochemistry F [0.50]

(1) Soil organic matter characterization, (2) dynamics of soil organic matter, (0.5) nutrient cycling. Offered in odd-numbered years.

LRS*6360 Soil and Water Chemistry F [0.50]

Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions.

LRS*6380 Advanced Soil Chemistry W [0.50]

The mathematical development of solute speciation models for aqueous solutions, surface complexation models for inorganic soil constituents and descrete and continuous functional group models for humic materials.

LRS*6400 Soil Nitrogen Fertility and Crop Production W [0.50]

Emphasis will be placed on soil N transformations and processes, and N sources for crops; field experimentation methods; environmental issues.

LRS*6420 Soil Productivity F [0.50]

Soil physical, chemical and biological characteristics as they influence crop growth with emphasis on processes and mechanisms.

LRS*6440 Field Sampling Strategies and Geostatistics W [0.50]

Concepts and practical aspects of collecting, synthesizing and interpreting data from spatially and temporally variable and/or correlated fields. Hands-on experience in describing spatial structure of large data sets (supplied by student or instructor) using available software. Offered in even-numbered years.

LRS*6581 Special Topics in Soil Science U [0.25]

Issues that are relevant to the current research of faculty or visiting faculty. Generally presented as a combination of lectures, student seminars and written projects.

LRS*6582 Special Topics in Soil Science U [0.50]

See LRS*6581

Environmental Earth Science

LRS*6280 Soil Physics W [0.50]

The soil as a physical system with special regard to soil water movement and the diffusion and dispersion of chemical substances. Numerical techniques and computer solutions will be developed.

LRS*6360 Soil and Water Chemistry F [0.50]

Thermodynamics of soil solutions; solution-solid phase equilibria; reaction kinetics; computer modelling of solute-mineral interactions.

LRS*6700 Glacial Sedimentary Environments U [0.50]

Students will learn about the processes and deposits of glacial environments as well as the use of sedimentary records to reconstruct past glacial environments. Case studies from modern to ancient glacial seimentary environments will be used. Field trip included.

LRS*6710 Advanced Sedimentology F [0.50]

Topics covered through case studies of sedimentary deposits and environments include facies analysis, large scale controls, and novel techniques in sedimentology. Topics may also include specific sedimentary envionments or specific sedimentary deposits such as turbidites, cross-bedded strata or seismites depending on student interest.

LRS*6730 Special Topics in Environmental Earth Science U [0.50]

A study of principles and analyses of local environmental problems involving the application of geological and soil information of land use applications and possible hazardous conditions.

Land Resources Management

LRS*6760 Advanced Remote Sensing W [0.50]

Critical review of the latest research papers on the use of remotely sensed data for temporal monitoring of the biosphere. Offered in odd-numbered years.

LRS*6881 Special Topics in Land Resources Management U [0.25]

Issues that are relevant to the current research of faculty or visiting faculty. Generally presented as a combination of lectures, student seminars and written projects.

LRS*6882 Special Topics in Land Resources Management U [0.50]

See LRS*6881

Other

LRS*6500 Land Resource Science Research Project U [1.00]

A concise, critical review of an area of study related to the field chosen by the student including analyses and interpretation of relevant data. The project will be written in the form of a scientific paper and presented to the department as a seminar.

Restriction(s): Available only to students registered in LRS MSc by coursework.

LRS*6900 Research Issues I F [0.25]
Principles and philosophy of scientific research including the development of superior communication skills.

LRS*6910 Research Issues II W [0.25]
A continuation of Research Issues I.